is just amazing to say, but anyway in this proceeding I have worked for Pacific Bell, Airtouch (phonetic), former Pacific Tel, and also for Bell Atlantic PCS.

In terms of the head start I think we have had market experience on that. I don't think the head start is important. Two facts, number one, the point I just made that the market continues to grow at the rate of 35 percent a year or even 25 percent a year.

There are a lot of new customers for everyone to get, okay? That is fact number one. Fact number two is there was a question this morning about lock in of cellular customers.

I think again in the big MSAs there is not lock in because over the next few years you are going to have to have customers change from their microtack (phonetic) analog devices -- put a plug in for Motorolla -- to a digital cellular.

So people are going to have to buy new subscriber equipment anyway. It is not as if they are locked in to their analog equipment.

That equipment may be subsidized. Rebates may be given by the cellular companies, but there is nothing to stop PCS or ESMR companies from doing that too.

In fact the ESMR companies are planning to subsidize the subscriber units just like the cellular people have done.

And then the third reason I don't think that it is important is that we have already run this experiment before. And the experiment that we ran was that in every -- of the top 30 MSAs in cellular, all but Boston and Washington had a head start on the order of 12 to 18 months for the block B carrier.

And I haven't looked at it in the last few years, but in about 1991 I actually did a study of this, and there was no remnant of the head start. In other words, the block A people who came in later, different periods of time and different MSAs had not really been adversely effected.

So to the extent that we have run this experiment and, you know, we have a fast growing

industry which is why I think the block A cellular people weren't disadvantaged, I don't really see that head start as really leading to, you know, a poor competitive outcome.

MR. PEPPER: Couldn't one difference though -- factual difference be that the people who bought handsets to operate on block B could easily switch to block A?

MR. HAUSEMAN: First of all, we have also run this experiment in London. Someone talked about one to one this morning. Mercury, slash, cable and wireless, slash, U.S. West had started this summer in London. They run GSM on the 18 hundred.

Demand has been so great that they have actually had will to ration their subscriber units. Their suppliers have not been able to keep up with demand. So here is somebody who came in again with the new type of units. You couldn't use your old cellular units on Mercury GSM.

They offer a very innovative service, off-peak free calling, and they have been inundated

with demand. The last statistics I saw was that 50 percent of all the new cellular hookups -- mobile hookups -- excuse me -- in London in the last quarter were on one to one.

So they -- you know, in terms of new hookups were doing better than --

MR. PEPPER: Do you recall how much spectrum they got for that.

MR. HAUSMAN: I think in England they have a fair amount.

MR. PEPPER: All right. As I recall, the cellular incumbent did not receive any additional spectrum.

MR. HAUSEMAN: Right. They also have -- I think they had 50 megahertz to start with.

MR. PEPPER: 50?

MR. HAUSMAN: Yes, some of the people have 50, I think.

MR. PEPPER: The new entrants didn't have to move anybody, did they?

MR. HAUSMAN: Right.

MR. PEPPER: They weren't microwave --

MR. HAUSMAN: In Australia though they have 20 megahertz for GSM.

But you know, in terms of a head start I think people will be able to offer service. And I don't see any reason why if they can offer a good service at the right price they won't be able to get the customers.

There is nothing to stop people from switching over from cellular. But even if no one switches, given that the market is doubling in size every two years there is going to be more than enough demand for them to make their system viable.

MR. PEPPER: Stan?

MR. BESEN: I have submitted comments in this proceeding on behalf of the Cellular Telecommunications Industry Association.

I guess I agree with Jerry on the notion that the head start is probably not a significant factor here. And it seems to me there are a couple of factors some of which he has already eluded to.

One is the very rapid growth. Second is the fact that the service offerings themselves are

going to change greatly over this period of time. We heard this morning discussions on a very large range of services that potentially may be offered under the PCS rubric most of which are not now on the market.

In a world like that the new entrants are as well positioned as the incumbents to offer those services. The -- I think of the analogy here of the personal communications market -- personal computer market when we might have sat here in 1982 and thought that IBM's head start was insurmountable and nobody would ever talked about Dell or AST or any of the large number of other companies that seem somehow to have rather nicely overcome the head start of a firm that would have been regarded as a formidable competitor.

The last point I guess is there is some -- there is -- at least I mentioned to this point one disadvantage the incumbents have and that is the continuing allegation to provide analog service for a time, something the newcomers will not have -- not be responsible for providing.

And that will be -- that is a factor that is in fact a burden as opposed to an advantage that the incumbents have. And it should be reckoned in the calculus.

MR. PEPPER: Dan?

MR. KELLEY: I have filed a couple of papers in this proceeding at various times at various stages for MCI. So MCI is my client. I view the six of you and the people you report to from a marketing point of view as my customers because if you don't believe that what I'm saying is in the public interest, it is not going to happen.

On the head start issue I learned about head start from Stan. He filed a paper in 1982 or 1983 or for the A side cellular carriers who are worried about the head start that the wire link carriers were going to get.

And as it turns out Professor Hausman is exactly right. It turns out not to have mattered very much in that situation. And I suppose there are a lot of explanations for that.

However, we are right now -- and one of the explanations might be it was very early in the wireless game and customers were just becoming familiar with what the service was.

Right now we are in this accelerated growth phase. And that can cut two ways. One, it can say, well, the head start is not going to be a problem as Professor Hausman argues. The other is that if we get much delay in PCS we might hit the top of that curve before the new guys get to come in and feast off that accelerating part of the S curve.

But the bottom line I think is why take a chance, you know, on whether the head start problem is or is not there. Let's move very quickly to license new competitors and get them out in the market and minimize whatever head start there is.

UNIDENTIFIED SPEAKER: I'm also curious to hear both Stan and Jerry's response and Dan's to what we heard this morning which is clearly people telling us that the head start was a serious issue in their forecasts and how -- where you think their

forecasts are wrong. You were both here this morning, I think.

MR. HAUSMAN: Well, I think that -- I have to admit I haven't read all the papers that came out. But I think in terms of where their forecasts are wrong, their forecasts by and large are flatly inconsistent with stock market values. And until somebody convinces me that the stock market gets it wrong, that is enough for me as an economist.

Where I really think that they are missing it is that I didn't hear anyone talk at all about the necessity of switching over the majority of cellular customers to new handsets which as I understand it is just going to have to occur. I mean, you can't run digital off an analog handset.

And then I think the second point is is that -- that I think they may have been much more pessimistic about when we are going to hit the top of the S curve than I am.

You know, you can never be sure of this, but to the extent that this becomes a -- let me put

it this way, the paging industry talked for years about how can we keep growing. And then about five years ago the paging industry actually slowed down.

And then what happened was Pagenet (phonetic) hit the market. Pagenet joined the 900 band of paging. And they decided to come in and offer a low price service. And what Pagenet did was they were so successful that they got more new paging customers last year than all of the -- our blocks and the rest of the paging companies combined.

So it is my belief that what they have really done is finally started to get the elusive consumer market rather than just the business market which paging had been aiming for for years.

And I do agree with people this morning that for PCS to be really successful they are going to have to hit the consumer market and be successful there.

And I think with a lower prior offering perhaps without all the bells and whistles will be

able to do that. And we are a long way from the S curve. And I really do expect rapid growth through the end of this decade in mobile telecommunications.

MR. BESEN: I think the most striking thing to me in listening to the morning discussion was the fact that apparently when one goes out to tries to ask people about these new services it is very hard for them to picture exactly what they are going to be.

And consequently as a result I'm inclined, although I'm sure the estimates were made with as accurate as they might be, that in fact there is substantial difficulties in doing the market forecast in markets where the evolution of technical change and the evolution of service offerings is so great that nobody will recognize a year from now -- not even thought about in the future of services that now people are trying to do forecasts for.

And so I think it is just very difficult to put tremendous weight on estimates of that sort

given the considerable uncertainty that the respondents of those kinds of surveys have in determining how much of something they are likely to buy at prices that are hard to determine in advance without knowing with any great particularity what features there are.

I think we discover uses for things after they are made available to us. That certainly is true in the history of say personal computers.

UNIDENTIFIED SPEAKER: The most famous forecast in this business was AT&T, so at the time of divestiture it was forecasting a million cellular companies by the end of this decade.

MR. BESEN: I think they were forecasted ultimately television penetration would be about half of U.S. households. Or just imagine what forecasts of fax sales would have been, say, five years ago. Very hard to do here.

UNIDENTIFIED SPEAKER: The most famous forecaster in economics I think was Irving Fisher who shortly before Black Tuesday said the market was going to keep going forever.

UNIDENTIFIED SPEAKER: The problem with Irving Fisher was he had his money in the market.

MR. BESEN: On the head start issue I'm going to be very interested to hear what the people in the next panel have to say.

MR. PEPPER: I was going to say that. In fact one of the questions that comes up is how do you -- this actually came from the audience. You know, how do you equate a six-month to a two-year head start between the A and B carriers in cellular and a 10 to 12-year head start between cellular and new entrants if in fact they are in the same business. And I guess that is what we are hearing.

Where there is some real disagreement here is that, you know -- one school of thought is that the market is expanding so rapidly with new services that we don't know that there is no head start problem.

On the other hand I think Dan and some others are saying that notwithstanding the rapidly growing market there are head start problems.

And if you take a look at the cost of acquiring a subscriber for cellular today as being a very expensive part of the business, and what incumbents can do to hold onto those customers may become more important.

So it will be very interesting to ask the investment -- and I assume they are all sitting here. So be forewarned. You are going to be asked about these questions.

If we could shift a little bit into some of the other variables on how the Commission can promote a competitive market structure we haven't heard anything yet about the geographic size or scope of the license. If you could address that and what other kinds of licensing requirements you believe are necessary in order to promote a competitive market.

Why don't we actually start at the other end of the table first.

UNIDENTIFIED SPEAKER: I just had a question or a clarification. Do you want to do questions two and three together then? I was

trying to figure out what you were --

UNIDENTIFIED SPEAKER: Yes. Where are we?

MR. PEPPER: We started with one and slid into two. And I think that we have already begun talking a little bit about three which is some of the cellular telephone companies.

The question there for the rest of you is are there specific types of market participants who might deserve special treatment.

And we have been talking a little bit about some of the advantages that cellular and ESMR companies might have in terms of scope economies. And by implication they might need special treatment.

There are also questions about designated entities, wire line, exchange carriers, others, ESMRs, and so on. So I think to the extent to which we are looking at these variables together, if you can comment on them.

But I think it would be useful if we maybe started talking about the geographic scope

and perhaps some of the problem that were identified by this morning's panels with the existing cellular market structure with the difficulties that follow you anywhere types of services and whether or not there is something that we can do to remedy that and result in a more competitive market. Dan?

MR. KELLEY: Thank you. I guess we are going to -- the panelists are going to continue to disagree on the aggregation problem. I still think it is a concern. And given that concern I think that you want warn to have large geographic licenses rather than small ones.

I don't think that the larger markets we have out there now, the MTAs, are all that bad. I would hate to see it grow any smaller.

I was one of those early on in this proceedings who supported the notion that it might be good to have a nationwide geographic license.

The lawyers and lobbyists have told me that that is not in the decision set anymore. I think that the next best alternative is to have a

license large enough that to the extent competitors feel they need to aggregate to a nationwide presence, such as mobile link is going after, it would be easier for them to do that. So I like the larger rather than the smaller licenses.

What was the second part of --

MR. PEPPER: Well, why don't we just deal with the geographic size and come back to other --

MR. KELLEY: Oh, the types of competitors. Again, I think going back to a point I made a little bit earlier, cellular companies -- and it was reinforced by what I heard this morning -- they're in the market.

They have got 25 megahertz spectrum. They are going digital. They -- we do -- our firm does a lot of work for a lot of companies in the wireless business and the radio communications business.

And what our clients are telling us is that the cellular companies are very busy. They are preparing for this competition that is coming. That is good. That is exactly what we would expect

them to do.

But the point is they are already there. So let's bring in some new people in the market to complete with them.

MR. PEPPER: Stan?

MR. BESEN: I don't want to be associated with the view that says that aggregation is, quote, no problem. I think that is too strong.

Clearly there are go going be costs to any reallocation that exist. I guess I've never been very strongly convinced by either side of the argument that says it is terribly costly to -- asymmetrical costly to integrate great up than to -- than to vest down. So I tend to be an agnostic on that point.

If it turned out that national licenses were efficient, then they probably will emerge even though there may in fact be some costs in doing so.

MR. PEPPER: On that some people have argued that in fact nationwide licenses in cellular would have been very efficient and that there have

been a number of players attempting to put those together for the last five or six years and they have not yes succeeded because of the licensing structure in the industry.

MR. BESEN: There are costs to the aggregation. There is no doubt about that. It is equally possible that in fact there be some market -- or some market segment better served by a series of narrow more localized firms.

And if you started out with a national market structure we might be sitting here wondering whether -- the great difficulty this industry has in getting down to a size more appropriate for the services being offered.

So I don't think again once can know in advance which of these structures is most appropriate. Obviously one has to make some guesses.

I think the notion of having some sort of diversified portfolio so that there is some large and some smaller ones seems to make some sense.

On the issue of whether or not the

incumbents have enough I always regard that as sort of an odd question. In most markets we let firms grow if they want to do so and can do so by offering additional services to customers that customers want and provide it efficiently.

We only worry about them growing too much if in fact they -- those raise anti-competitive concerns. So I don't know what the notion of enough exactly means here.

There certainly is a size to which firms might grow that would raise competitive concerns for me. But simply the notion that the incumbents are already capable of providing PCS services does not answer the question of whether or not they should be permitted to require additional spectrum.

It is a quite separate question and should be judged in terms of competitive concerns. And I fairly clearly differ from Dan in this regard.

MR. PEPPER: You all may want to come back to that because it seems to me there are

really two questions you can ask about that.

Specifically one is whether or not cellular's entry into the market by acquiring spectrum would raise their rival's costs, the new entrant's cost, or alternatively if you allowed cellular to acquire in the extreme so much spectrum as to foreclose entry by new entrants, there are a number of potential -- there are questions that you can ask to tease out answers on that question.

So I think that --

MR. BESEN: My only point is that Dan's notion that already have enough is not dispositive. Far from it. And in our view, they could acquire a significant amount.

MR. PEPPER: Without increasing rival's costs for foreclosing entry.

MR. BESEN: I don't know exactly how rivals' costs are raised here. Rivals have access to the spectrum. There is no direct effect on the cost of the rivals.

MR. PEPPER: I guess that is a question that goes back to some of the technical matters

relating to -- you know, given that we do not have an infinite amount of spectrum. We're working with a finite amount.

To the extent to which you as -- by giving spectrum -- by dividing the spectrum up into smaller blocks thereby increasing cost of clearing, increasing costs of equipment, increasing cost of network operations where there are trade-offs of spectrum versus you know, the network operations.

MR. BESEN: It obviously depends on the particular numbers one's talking about. We have gone through a rather extensive set of calculations under a whole variety of different market structures. I commend you to look at them.

There is a whole series of them under a number of different circumstances some of which involve ESMR, some of which don't and raises assumption about the advantages of digital over analog.

Again one can't answer that question in principle. I'm just objecting to Dan's sort of blanket assertion that because PCS is offering --

is offering -- I'm sorry -- because the incumbents can provide PCS services in their existing allocation that that therefore applies that they should get no additional spectrum. That seems to me to be a nonsequitor.

MR. HAUSMAN: Well, I think the point I'm making is that the cellular companies as they stand with technology changing have the capacity to grow with their existing allocations.

MR. KELLEY: I thought, Bob, when you asked the raising rivals cost issue -- what came into my head which is an interesting one to think about and I don't know if I want to give you the answer today -- but the concern that if you let the existing cellular carriers funded by their local exchange company currents for the most part beared in every spectrum band the end result is they have a position to protect and may in the process of protecting the rents that they get from that position spend those rents in the spectrum auction and drive up the prices of acquiring frequencies to compete against them.

MR. PEPPER: I'm sure Stan has an answer to that.

MR. HAUSMAN: Actually, I'd be glad to.

MR. PEPPER: Okay. Jerry, why don't you -- you're not shy.

MR. HAUSMAN: Okay. To start with this is MCI's exact argument for why the cellular companies shouldn't be allowed to buy block A cellular circa 1985 which they argued to Judge Green that they had a position to protect, and that they should not be allowed in -- remember MCI got a lot of spectrum for free from you guys and they sold it to McCaw (phonetic).

Then they had the chutzpah to come in and say that the blocks had this position to protect and should not be allowed in block A.

But again I have done econometric studies here. And the prices actually are lower where the blocks are competing with each other in A and B then when they are facing non-blocks.

So again there is no evidence that the blocks have not competed in cellular and tried to

protect their position.

This is a recycled argument. It didn't work last time. I don't think it should be allowed on the table this time.

MR. PEPPER: Well --

MR. HAUSMAN: I haven't finished. I have the floor. So that is my first point.

The next point, the raising rivals' cost, you forgot the second part of the phrase, Dr. Pepper. To maintain power over price. Okay?

And the question is how -- if you let the cellular companies in, how are they going to maintain power over price? Even if they got 20 megahertz, you know, between them, that is only 40 out of the 120. There is still 80 left.

There will be no vertical relationship between cellular companies and PCS. Usually when you worry about raising rivals' cost you have a vertical relationship in which I increase a price of one of your inputs.

But since the PCS people will not be depending on cellular one iota, I really wonder how